Lectures

ON

THE DIAGNOSIS AND TREATMENT OF THE PRINCIPAL FORMS OF PARALYSIS OF THE LOWER EXTREMITIES.

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LECTURE IV.—(PART I.)

SYMPTOMS AND TREATMENT OF VARIOUS FORMS OF PARAPLEGIA DUE TO WHITE SOFTENING, HÆMORRHAGE, TUMOURS, ETC.—GENERAL CONCLUSIONS OF THE COURSE.

Symptoms of white softening of the spinal cord.—Symptoms of hæmorrhage in the grey matter of the spinal cord.—Resemblance and differences of the two preceding affections.—Prognosis and treatment of paraplegia due to softening of or to hæmorrhage in the spinal cord.—Symptoms, prognosis, and treatment of hæmorrhage in the vertebral cavity.

GENTLEMEN,—The most frequent cause of paralysis of the lower limbs is certainly an inflammation of the spinal cord. The cause of paraplegia which comes next as regards frequency is the white or non-inflammatory softening. This affection is produced in the spinal cord in a similar manner as in the brain—i. e., in most cases as a consequence of an alteration of the bloodvessels, the walls of which do not allow that free interchange of matter between the nervous tissue and the blood, which constitutes nutrition—or probably in some cases as a consequence of interruption in the circulation of blood by the presence of a clot in a bloodvessel, or the pressure caused by a tumour upon a bloodvessel. I shall not say more as regards the history of the morbid anatomy of the spinal cord in this affection, as my object is only to study the symptoms and the treatment of the various forms of paraplegia.

Usually patients attacked with the non-inflammatory softening of the spinal cord at first complain only of weakness. They gradually become weaker, although their general health may seem to be as good as ever. They feel the weakness especially at the knee- and ankle-joints; they find it very difficult to go up or down stairs, to go in or out of a carriage, and their gait becomes tottering, especially when they cannot direct their movements with the help of the sight. When lying down, if they see the lower limbs, they can move them pretty freely, but without force. After a time the paralysis becomes much more marked, and then sensibility in the whole length of the lower limbs and the power of the will over the bladder and the rectum are also found much diminished. There is no pain, or hardly any, in the spine or paralysed parts. Very rarely is the urine altered. The temperature of the lower limbs is often higher than it is in health, especially when the paralysis is complete or nearly so.

We will refer to the preceding lectures for the diagnosis between the form of paraplegia depending upon the non-inflammatory softening of the spinal cord and the reflex paraplegia, or the forms of paraplegia due to myelitis, meningitis, or congestion of the spinal cord and its meninges. As regards the other forms of paraplegia, their diagnosis from that caused by softening of the cord will be indicated in another part of this lecture. We will merely say here that the absence of cramps, of pain in the spine and lower limbs, and of several other symptoms of disease of the spinal cord or its membranes, will help more for the diagnosis of the non-inflammatory softening of this nervous centre than the symptoms which we have described as existing in this affection.

Hæmorrhage in the Grey Matter of the Spinal Cord.—Paraplegia due to this cause is characterized by the suddenness of its production, by a pain at the part of the spinal cord where the hæmorrhage occurs, owing, probably, to the distension of the posterior roots of the nerves in the grey cornua, by a pain in the spine after pressure upon it, and also by a pain in the parts of the body where are distributed the nerves originating from the part of the spinal cord which is the seat of the disease. The sphincters of the bladder and rectum are almost completely paralysed from the very first.* It is not rare that an inflammation supervenes in the parts of the cord surrounding the clot, and then all the symptoms of myelitis occur.

According to the seat and the extent of the hæmorrhage the symptoms vary extremely. If the amount of blood effused be very small, the symptoms may be very slight, and the patient may recover in a few months, as in a case recorded by Cruveilhier. If the amount of blood is considerable, it descends along the whole length of the central canal of the spinal cord, and also sometimes breaks through the grey cornua, especially the anterior ones. The loss of sensibility and of voluntary power is then complete, and the temperature of the paralysed limbs is increased. If the hæmorrhage is limited to one lateral half of the grey matter,—as in a most interesting case recorded by Monod, and in another by Mr. Oré,†—there is loss of movement in the side of the hæmorrhage, and loss of sensibility in the opposite side.

It is a remarkable feature of paraplegia due to hæmorrhage in the grey matter of the spinal cord that a diminution of sensibility is always one of its first symptoms; and that when the whole of the grey matter is altered by the effused blood, the anæsthesia is complete.‡

Diagnosis of the Hæmorrhage in the Spinal Cord.—The suddenness of the production of paraplegia is almost sufficient to show that it is due to effused blood, but it remains to decide whether the blood is in the tissue of the spinal cord, or in the vertebral canal, outside of this nervous centre. In this last case, there is more pain in a great extent of the spine than in the preceding; and also tetanic convulsions are not rare when the blood is effused outside of the spinal cord; while a hæmorrhage in the cord has never produced convulsions, so far as I know. Besides, there is more marked anæsthesia in cases of effusion of blood in the tissue of the spinal cord than outside of it.

It is usually very easy to distinguish a hæmorrhage in the spinal cord from a white softening of this organ. The suddenness of the production of the paralysis and the existence of the pains will sufficiently characterize the first of these affections; and in those cases of almost sudden paraplegia, owing to softening, the absence of pains (in the spine, &c.) will serve to distinguish this form of paraplegia from that due to a hæmorrhage. I need not say that these two affections—i. e., softening and hæmorrhage—do not rarely co-exist. This co-existence will not be surprising to anyone who knows that in the spinal cord, as well as in the brain, the same morbid condition of bloodvessels is usually the cause of both these affections.

Prognosis of Paraplegia due to White Softening or Hæmorrhage in the Spinal Cord.—The great indication for the prognosis in cases of softening or hæmorrhage in the spinal cord is the extent and degree of the paralysis. A softening limited to the lower part of the dorsal region of the spinal cord may admit of a very prolonged duration of life. A hæmorrhage is a more grave affection than a softening, because there is always a great chance of its being reproduced, and also because the blood effused may cause very extensive alterations. We do not know a single case of complete cure of paralysis of the lower limbs caused by softening or hæmorrhage in the spinal cord; but, as far as diagnosis not confirmed by autopsy may be relied on, we can say that we have seen many cases of non-inflammatory softening of the spinal cord arrested in their development, and, still more, that in five or six cases a very notable amelioration has taken place.

Treatment of Paraplegia due to White Softening of the Spinal Cord.—The treatment of this affection ought to be pretty much the same as that of hemiplegia caused by a non-inflammatory softening of the brain. We will not enter here into the discus-

* Very numerous cases of various kinds of disease of the spinal cord which I have analysed lead to the view that the nerves of the rectum and of the bladder do not pass close to those of the sphincters of these organs in the spinal cord. The last nerves seem to be near the very centre of the grey matter, while the others seem to be chiefly in the white anterior columns.

† I have given a summary of these two cases in my "Lectures on the Central Nervous System." Philadelphia, 1860, p. 96, Cases 30 and 31.

‡ See the above-quoted Lectures, p. 87.

sion of the various modes of treatment which have been proposed or employed in this last case; we will only mention the general plan of treatment we have employed with some appearance of success in many cases of softening of the spinal cord.

1st. Iodide of potassium is the principal of the remedies that may be relied upon. We generally employ it in doses of five grains twice a day, mixed with nearly the same doses of sesquicarbonate of ammonia, in a decoction of cinchona bark, or an infusion of calumba or rhubarb. We insist upon the importance of taking this mixture before food in the morning and an hour before dinner, to avoid the decomposition of the iodide by the gastric juice and the setting free of the iodine, which sometimes takes place, and causes a gastric disturbance, erroneously attributed by some practitioners to the iodide itself.

2nd. Besides the preceding remedy, we prescribe various tonics, such as iron and cinchona-bark wine.

3rd. Strychnine may be employed with some profit in those cases where the paralysis is slight; but it must be remembered that, on account of the congestion produced by large doses of this alkaloid in the spinal cord, there would be danger in making use of it in cases where, the paralysis being complete, or nearly so, there is reason to think that the bloodvessels of the spinal cord are much altered, and that therefore a hæmorrhage might be the consequence of the action of strychnine. I need hardly say that those remedies which diminish the amount of blood in the spinal cord (such as belladonna, ergot of rye, &c.) should not be employed in this form of paraplegia.

4th. Besides the use of some of the above remedies, I recommend, as an excellent means of improving the nutrition of the spinal cord, the daily use of the cold douche or the cold shower bath applied to the spine. Sea-bathing may also be of service.

5th. The patient should lie down flat on his back at night; he should live upon the most nutritious food, drink wine and beer in a moderate quantity, and take as much exercise in the open air as possible, without however exhausting his diminished power of motion. Shampooing and galvanism may be applied with profit to the paralysed limbs.

Treatment of Paraplegia due to Hæmorrhage in the Spinal Cord.—The same rules are to be followed in cases of this kind of paralysis as in cases of softening of the spinal cord, with these slight differences: that, 1st, three doses of iodide of potassium, instead of two (of five grains each), ought to be given every day; 2nd, strychnine ought not to be employed; 3rd, constipation, lying down on the back, and all other causes of congestion of the spinal cord, should be carefully avoided.

Symptoms and Treatment of Paraplegia due to Hæmorrhage in the Vertebral Canal.—A hæmorrhage between the spinal cord and its bony envelope is fortunately an event of rare occurrence. I have seen but one case of this kind of hæmorrhage, which proved fatal in less than two days. The blood is effused either between the pia mater and the arachnoid, or (more rarely) between the dura mater and the vertebræ. The first symptom is usually a pain extending along the spine from the seat of the hæmorrhage to the lower extremity of the vertebral canal. Almost immediately a complete paralysis of the lower limbs and very often tetanic convulsions appear. In almost all cases this hæmorrhage is rapidly fatal, either in consequence of its influence upon the circulation or respiration, or, indirectly, in consequence of an acute and extensive meningitis. Our object being here to study paraplegia in its chronic forms, we will not say more upon the symptoms of this affection.

As regards the treatment of the hæmorrhage in the vertebral canal, we will only say: 1st, that, at once, all the most active means usually employed in the various cases of visceral hæmorrhage should be made use of; 2nd, that the patient should be placed in bed on one side, and not on his back; 3rd, that pounded ice should be applied, in bladders, all along the spine; 4th, that if the patient survives several days, the same treatment as is above prescribed for cases of hæmorrhage in the grey matter should be employed.

COD-LIVER OIL INCORPORATED WITH BREAD.—Take seven ounces of crumb of bread and toast it slightly; boil it then with one pound of water, and reduce to half; strain and heat again gently until you get a mass resembling gelatine. Add then three ounces of white sugar, and two drachms of isinglass. Take the mixture from the fire and allow it to cool. To four ounces of this mass, add the following compound: cod-liver oil, two ounces; cinnamon-water, half an ounce; essence of lemon, twelve drops; the whole to be well pounded in a glass mortar. M. Balsi, who gives this formula, says that the white oil should be preferred, and that it should be recent and of good quality.

A Course of Lectures
ON
PAIN,
AND THE
THERAPEUTIC INFLUENCE OF MECHANICAL AND PHYSIOLOGICAL REST
IN
ACCIDENTS & SURGICAL DISEASES.

Delivered in the Theatre of the Royal College of Surgeons.

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LECTURE III.—(PART II.)

I HAVE thought it right to make these brief observations in reference to concussion of the brain. I will now add a few words respecting concussion of the spinal marrow—a condition, I think, more frequent than formerly, (probably in relation to the prevailing kind of railway accident,) in which a patient may experience slight and temporary numbness, or inability to control his legs and arms. I will put a case of concussion of the spinal marrow before you thus:—

A gentleman falls, without violence, with his back upon the hard ground or soft turf. There is no mental confusion, no cerebral disturbance. He feels a transient, peculiar sensation—called pins and needles—in his hands and feet; he gets up, walks or rides home; feels little or no inconvenience; makes arrangements for the morrow; but in the morning is unable to get up, because, he says, he is in pain all over; he feels sore and stiff, just as if he had been bruised, making it painful for him to move his limbs.

Now, can this be a disturbed circulation? I really believe not. What has happened in this case? It is possible that the spinal marrow, obeying the law of gravitation, may, as the body falls, precipitate itself in that direction—may fall backwards towards the arches of the vertebræ, and be itself concussed in that way; or the little filaments of the sensitive and motor nerves, which are delicately attached to the spinal marrow, may, for a moment, be put in a state of extreme tension, because, as they pass through the intervertebral foramina, they are fixed there by the dura mater; and if the spinal marrow be dragged from them, the intermediate parts must necessarily be put upon the stretch, producing at the time the "pins-and-needles sensation," and explaining the symptoms felt on the following day. He has not caught cold; has no rheumatism; nor has he been bruised. The stiffness which he feels is not the result of the local injury. He has received no blow where the pain is experienced. No such explanation will apply. These symptoms must all depend upon something which occurred when he fell. Has he stretched the trunks of the nerves, or the little filaments forming the roots of the nerves? or has the spinal marrow itself suffered molecular disturbance? No doubt that sensitiveness of the surface, which creates pain on being touched, and the stiffness which he experiences, are the result of something which has disturbed the sensitive and motor nerves conjointly or individually, if one function be disturbed and not the other; or the mischief may have occurred in the interior of the spinal marrow. It is impossible that these symptoms could be the result of anything but some such structural disturbance; and they are, to my mind, the evidence of decided injury to the nerves or marrow, although what that injury may be is not ascertainable. So it is when the spinal marrow has been impaired by a blow, or direct force; by a shake or a to-and-fro motion (as occurs in railway collisions), in which the marrow is least efficiently defended from external injury by the mechanical contrivance employed in the construction of the vertebral column. The deterioration of function which follows such accidents must be the effect of some kind of structural

disturbance, for it occurs immediately after the blow. It is a shock to the spinal marrow; at least, that is the most reasonable light in which to consider it, especially with reference to proper treatment.

The object here should be to give the marrow rest from occupation by not allowing the patient to take walking exercise at all; or if at all, the exercise should be short of fatigue, and certainly he should not be advised to endeavour to "walk off" his condition. There seems to be an impression in the minds of the non-professional public that if a man receives a concussion of his brain or spinal marrow, or has a fall which gives him these sensations, the best plan is to "run it off." A little while ago I had occasion to see a gentleman in the country who had a fall upon his back at Epsom a few years since. The accident occurred from some scaffolding giving way. When he fell, he experienced the sensation of pins and needles in his legs. He was a most energetic man, and he set off and ran six miles. When a boy, he had been told that if he ever had an accident of that kind he should run it off as quickly as possible. Within a very short time he began to have spinal marrow symptoms, which have resulted in complete and irremediable paraplegia. I firmly believe that if, upon receiving the injury, he had gone home, and kept himself quiet and the spinal marrow unused for a considerable period, he would have been well at this time. It was a great error to adopt the course he did. It is this misdirection, this misuse of early exercise after a shock to the spinal marrow, that leads to more serious mischief—to chronic inflammation or softening of the marrow, which probably remains incurable.

It has occurred to me to see many of such cases of concussion of the spinal marrow, and some of the patients have been thought to be malingerers. For example: a patient who has suffered such a concussion continues his active exercise, takes no rest at all, or perhaps, after two or three weeks of rest, he may begin to resume his ordinary duties, but with some little difficulty in walking. It is observed that in a few days, or a week or two, the legs become feeble; there is a little jumping of the legs at night on going off to sleep, some sense of coldness in the limbs, slight dulness of sensation in the surface of one or both limbs, or of parts of one or both limbs. Then, perhaps, he is ordered by his surgeon to increase his exercise, so as to overcome the effect of disuse, especially if he is thought to be a malingerer. This adds to the exhaustion of the spinal marrow, and the plan, if persevered in, most probably leads to paraplegia.

The confirmation of the accuracy and applicability of these views is, I think, made apparent when it is added, that all these morbid effects of concussion of the spinal marrow are to be prevented, relieved, or cured by due and long-continued rest.

I do not mean to aver that the experiment to which I shall now allude proves our capability of exhausting physiologically the function of that part of the spinal marrow which is in direct continuity with the centres of the brain, and which is associated with the performance of progression; but it does demonstrate our power of exhausting the true spinal marrow, or excito-motory function. A person receives a fracture of the spine, which involves destruction of continuity of the spinal marrow in the dorsal region, leaving a portion of the spinal marrow perfect below the line of severance. If you tickle his feet, you excite involuntary movements in the lower extremities, through that excito-motory function which is apparently dependent upon the grey matter in the centre of the spinal marrow. You continue to excite by this means the movements in the muscles of the toe, foot, or leg, for some time, and you mention the patient's case to some other person, and ask him to go and see a specimen of excito-motory function. He goes immediately to the patient, tries the experiment, but it fails: he cannot excite motion. You see the patient again in a few hours, or on the following day, and perform the experiment successfully. The movements are visible, continue for a short time, and then cease; on the next day, perhaps, they reappear. Here, then, we have evidence that by over-excitation, which is equivalent to fatigue, we exhaust or destroy for a time the true spinal marrow function; and I accept the result of the experiment as an indication that by over-exertion, after concussion of the spinal marrow, we may injure it by requiring it to do more than it is competent to accomplish without fatigue.

The obvious intention of these remarks is to suggest that in cases of concussion of the spinal marrow by accident, it should have more rest than is usually allotted to it, in order that it may not suffer physiological exhaustion by premature and too vigorous exertion before its structures shall have repaired themselves. Experience points distinctly to this recommendation and conclusion; since we observe that after many months, or a year or two, such patients recover perfectly. On the other hand, recovery is sometimes rendered incomplete by persistent loss of sensation or wasting of some part; and this persistent loss, I apprehend, has reference to some distinct defect of structure in some minute filaments either of the spinal marrow or the nerves themselves.

I thought I could hardly pass over the subject of concussion of the spinal marrow without adducing these few observations, which I think have an important bearing on the function of the spinal marrow, and manifest the necessity for keeping it in a state of rest after accident; and I trust also that these remarks will have a tendency to promote improved treatment of such forms of concussion, the further consideration of which I now leave.

A few weeks ago a surgeon from the country came to my house with a patient. He said, "I want to consult you about a young lady who has a diseased toe. It has been very troublesome, and I have not succeeded in completely relieving her." With her was an elderly gentleman, a relative of the patient, a very kind-hearted man, and he thinks he is a good surgeon, and goes about doctoring the people, sometimes doing harm, and sometimes perhaps a great deal of good. He is very fond of animals, and has a number of pets. After I had examined, with the surgeon, the lady's toe, the elderly gentleman said, "Well, Mr. Hilton, what are you going to do to cure this young friend of mine?" I said, "I think we shall put a splint on the foot and keep the toe very quiet, attend to her general health, and Nature, in all probability, will do the rest." I then said to him, "What led you to adopt the occupation of a philanthropic surgeon in addition to your other occupations?" "Well, Mr. Hilton," he replied, "I will tell you. You know I am very fond of animals. Some years ago I caught a live mouse in a trap. I took it in my hand, and I said to myself, 'Poor thing! you must have suffered a good deal of pain and distress. You have had a severe laceration of your cheek; one of your eyes has been torn out; your skull has been broken, and instead of having bone covering your brain you have now only a thick dense membrane defending it.' Then I thought to myself, 'This mouse must have had difficulties in its treatment of its injuries; and'"—interrupting the relation of his story, he said, "I hope you won't be offended at what I am going to say?" "No," said I, "not in the least." "Well," he continued, "I said to myself, 'Surely this mouse, although it is cured, never had a physician or a surgeon!' I quite agree with you, Mr. Hilton, that Nature is a very valuable surgeon."

It would be well, Sir, I think, if the surgeon would inscribe upon his memory, as the first professional thought which should accompany him in the course of his daily occupation, this physiological truth—that Nature has a constant tendency to repair the injuries to which she may have been subjected, whether those injuries be the result of fatigue or exhaustion, or inflammation, or of accident; and that this reparative power becomes at once most conspicuous when the disturbing cause has been removed: thus presenting to the consideration of the physician and surgeon a constantly recurring and sound principle to guide him in his professional practice.

I will employ illustrations of simple surgery in this matter. An extraneous body falls upon the conjunctiva; it is immediately grasped by the orbicularis palpebrarum, and gradually pushed, by repeated involuntary closure of the eyelids, towards the angle of the eye, close to and below the puncta lachrymalia; thence the lachrymal fluid floats it upon the caruncula lachrymalis, where it becomes entangled by the hairs with which this structure is provided. So long as the extraneous body remains upon the conjunctiva, the redness, pain, &c., continue; but after its removal by the surgeon or nature, the whole of the inflammatory appearance vanishes, showing that it was only necessary to remove the disturbing cause. So if there be a thorn in the finger, you have but to take it out and the local irritation subsides. Or suppose you have a fish-bone in the throat, exciting constant involuntary efforts of deglutition,—as soon as it is removed all the disturbance in the throat ceases. So with an inverted toe-nail which is producing great pain and local inflammation: if you take off the edge of the nail, all these symptoms quickly vanish. Corns get well if pressure be taken from them. I admit that this is all very simple rudimentary surgery, but it illustrates a principle—that if the local disturbing or exciting cause, whatever it be, is removed, Nature has an immediate tendency to repair the injury which has been inflicted, because she is enabled to adopt her own remedy, rest.

This subject at first sight may appear to have but small

application in practice, especially when looked at through the biassed vision of those who think that in the treatment of disease or accident everything is to be done by medical or surgical aid; but I feel convinced that, however high may be our scientific acquirements, however deep and minute our researches into the phenomena of disease, however great our experience, even should it have been carried to the perfection of human skill in the treatment of every form of disease, each and every one of us, if candid and truthful, will admit that he has not the power of directly adding one single atom to the living tissue. Under the most favourable circumstances, all that any of us can accomplish in this direction is to give rest to the parts, and enable Nature, through her own efforts, steadily to pursue her inherited destiny, whilst we, as Nature's willing servants, act in the hope that, by the use of appropriate mechanical applications, aided, if necessary, by soothing medicines, and by the use of properly-adapted diet, we may facilitate her efforts to repair the injury she may have sustained. So, in fact, nearly all our best-considered operations are done for the purpose of making it possible to keep the structures at rest, or freeing Nature from the disturbing cause which was exhausting her powers, or making her repeated attempts at repair unavailing. The operation does not cure; it only makes recovery possible, where, without the aid of the hand or head of the surgeon, Nature would have ceased her competition with the results of the injury, or succumbed to the exhausting influence of unmitigated disease. In aneurism—I think I am not in error when I say that aneurism is cured by rest, and not by the surgeon. The surgeon takes care to stop the blood or to moderate its flow; the disease is actually cured by Nature herself—by rest. So in all operations for hernia, the object is to give the intestine rest and freedom from pressure, both immediately after, and for a long time subsequently to, the operation. Most of us now act upon this principle. We take care not only not to disturb the intestine by purgatives, but we give opium to arrest peristaltic action. We know the gut has been damaged in its function and structure, and will not bear excitement; that it requires rest and quiet to enable it to repair itself. Sometimes we carry this so far at Guy's Hospital, that one of my colleagues, Mr. Birkett, mentioned to me that in a case of operation for strangulated hernia, the bowels had not been opened up to the twenty-first day, and the question was asked, "What shall I do? Shall I give anything to the patient?" The reply was, "I think not;" and in the afternoon of the same day the bowels were well relieved. In chronic laryngitis, cured by tracheotomy, the cure is not effected by opening the larynx, but by giving the larynx rest. The operation is performed in reference to these two circumstances—in reference first, no doubt, to securing the continuance of life by allowing the patient to breathe through the tracheal tube; secondly and ulteriorly, the object is to give rest to the diseased part. In the performance of tracheotomy for disease of the larynx, the surgeon never touches the disease at all; he merely enables the patient to breathe through the tracheal tube, and to divert the stream of air away from the larynx, thus giving the larynx the opportunity of recovering itself. It is marvellous to see what happens in a few hours after the trachea has been freely opened in cases of traumatic injury to the top of the larynx, such as occurs from the accidental local application of scalding water.

And here I might remark upon the striking difference in the successful results of tracheotomy in cases of traumatic injury to the upper part of the larynx, as compared with the want of success of the operation in cases of diphtheria or croup. In the latter cases the patient may have a tube introduced into the trachea, and may breathe through it for a considerable time, yet the diseased condition of the larynx remains, and is fatal, from some zymotic cause still existing. It is not like the simple effect of a local injury: the seat of the local injury being kept quiet, the inflammation subsides, and the larynx rapidly recovers; whilst in the other case of diphtheria, whatever may be its cause, it still persists. Hence tracheotomy has not been successful as a curative operation in such cases.

I have here the sketch of a patient upon whom I performed the operation of tracheotomy twelve or thirteen years ago, to prevent suffocation from syphilitic ulceration of the larynx. She has lived by breathing through the tube ever since, scarcely any respiration going on through the upper part of the larynx. At one time the air which passed through it was not sufficient to bend the flame of a candle. I need scarcely add, the voice is totally lost, but she is not disposed to have any further operation performed in reference to clearing the upper part of the larynx, and the tube is still worn in the trachea.

So, again, if a portion of bone be pressed in upon the skull, you have only to remove it and give the brain rest, and the brain will repair itself. It is not the operation that cures the injury to the organ, but by removing the disturbing cause the brain recovers itself. I might allude, also, in the same spirit, to the operation of lithotomy. Stone is not the disease, although it is the cause of the symptoms. The patient does not complain of stone, but of the pain and irritation which the calculus induces within the bladder. So that if a patient has a stone in his bladder it does not necessarily follow that an operation should be performed. The same symptoms are sometimes produced when there is no stone at all. Perhaps you have a little ulceration of the bladder or prostate, with all the indications of stone. No surgeon can tell whether it is stone or not till he has explored the bladder. Those are the symptoms complained of, and by removing the stone you simply make it possible for these symptoms to be subdued by giving the parts rest. I have a gentleman under my observation who has had stone in the bladder during many years, probably for more than twelve years. I discovered the stone ten years since. He is seventy-four years old, and the only inconvenience he experiences is occasional and slight hæmorrhage from the bladder. He is always relieved by maintaining the recumbent posture. Having recently treated him for nasal polypi, I asked him, "How is the other affair?" "Oh," said he, "I have nothing the matter there, as far as I know; I am quite well." Stone, then, is a disease requiring operation because it induces a derangement of the structure which produces certain painful symptoms, and by removing the cause the part gets well—first, through the assistance of the surgeon, but ultimately through the medium of nature.

REMARKS ON A CASE OF PIARRHÆMIA ACCOMPANYING ACUTE DIABETES MELLITUS.

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THE pathology of fatty blood (piarrhæmia, pioxæmia, lipæmia) is still very uncertain. I avail myself of the following case (in itself of much interest) to point out, as nearly as may be, the present landmarks of our knowledge on this subject:—

A. G——, aged twenty-one, was admitted into the Middlesex Hospital on Nov. 3rd, 1859, under the care of Dr. Thompson. His history was as follows:—Six months before admission he had married, and, unfortunately, infected his wife with gonorrhœa. The ensuing domestic unhappiness occasioned a separation four months after marriage, *at which time he considered himself in good health;* but the circumstance preyed much upon his mind, and he became dull and low-spirited. *Three weeks* before admission, he first began to suffer from increased thirst, and at the same time noticed that he was voiding an unusual quantity of urine. From this period he had lost strength very rapidly. On admission, he was found to be in a state of alarming prostration, for which stimulants were freely administered, but without any good result. He continued to sink rapidly until the morning of the 5th of Nov., when he died. During his first twenty-four hours in the hospital he had passed five pints and a half of urine, acid, specific gravity 1031, and containing sugar.

Autopsy, eight hours after death.—Weather damp. Rigor mortis considerable; body not at all emaciated; diabetic odour preceptible. On the brain being removed, about four ounces of pellucid serum were discovered at the base of the skull. Immediately upon exposure to the air, this fluid became opaque, and its surface was shortly covered with a thin milky pellicle. This was set aside for examination. The blood, as it escaped from the opened sinuses, was fluid, homogeneous, and of a dull-red colour, like raspberry cream; but, in a very few seconds, it separated itself into two distinct portions, the supernatant layer being of the colour and appearance of thick, white cream, the subjacent presenting the usual appearance of fluid venous blood. For the purpose of further examination, blood was collected from the sinuses of the brain, from the innominate vein and right ventricle, from the hepatic veins, and from

the splenic vein. None could be obtained from the portal, nor from the superior mesenteric, veins.

These specimens were allowed to repose, and were examined the next morning. The general results were as follows:—

1. With the exception of a very small, non-adherent clot in the right ventricle, the blood was fluid in every part of the body examined.

2. The supernatant creamy fluid was found in every specimen, *except that from the splenic vein.*

Examined under the microscope, it appeared almost perfectly *homogeneous.* It contained *no oil-globules;* no cells (except a few scattered blood-corpuscles); and showed no trace of coagulated fibrin. Here and there were a few faint indications of amorphous granular matter, probably molecular albumen (?). *It was wholly taken up by ether.* The exact determination of its quantity was, unfortunately, not attainable; but it may be roughly estimated from the fact that, in a conical test-glass, the creamy layer occupied one-third of the whole.

3. The subjacent layer presented the usual appearance of *fluid* venous blood. Neither in that from the splenic vein, nor in that from any other part, was there the least trace of a clot, even after forty-eight hours. It contained the usual proportion of red and white blood-corpuscles, apparently of a normal character.

4. The reaction of the serum was *neutral;* it had no effect upon the colour of blue or of reddened litmus.

5. A volatile alkali was driven off by heat, which restored the colour of reddened litmus. This reaction, however, was afforded much more readily by the splenic blood than by any of the other specimens.

The remaining post-mortem appearances were as follows:—The brain (with medulla oblongata) weighed forty-nine ounces and a half. It was pale, and of extremely firm consistence, as though hardened in spirit. Under the microscope, however, its structure appeared to be perfectly normal. The muscular structure of the heart was of a pale rose-red colour. The right ventricle contained a very small, nearly colourless, non-adherent clot. All the valves were healthy. The upper lobe of the right lung contained a mass of crude yellow tubercle as large as an orange; this was surrounded by a distinct layer of pigment, and showed no signs of softening. The left lung was œdematous. The liver weighed sixty-eight ounces and a half; it was of an ashen-grey colour, and very friable; but microscopic examination showed no other change than an excess of fat in the liver-cells. The spleen (three ounces and a half) was small and pale; it contained one dark-coloured fibrinous deposit of the size of a hazel-nut. The mesenteric glands were not enlarged. The kidneys (each six ounces and a half) were large and flabby; the capsules non-adherent; the surface pale, faintly mottled; the structure coarsely striated. The supra-renal capsules were quite healthy.

This seems a well-marked case of diabetes mellitus, excited by psychical causes in a person of tuberculous constitution. It is not often that diabetes is distinctly referable to such a cause. Amongst the fifty-one cases recorded by Oppolzer and Heller, (Heller's Archiv., 1852, hft. xi.,) *fear* is assigned as the exciting cause in four instances. The extreme rapidity with which the disease ran its course is very remarkable. The ordinary symptoms of diabetes (thirst and polyuria) had existed for only *three weeks*, and that probably in no great degree, as the patient on admission was passing only five pints and a half of urine per diem. It is, of course, probable that the function of the liver had been disordered, and that the disease had been latent, for some time. But even thus it is impossible to assign to it a longer duration than *two months;* for at that period the man considered himself in perfect health. The most rapid case recorded by Oppolzer ran its course in three months. And this extreme rapidity serves to explain why, with such intense prostration, no emaciation was present; for (as we may observe in fever) it takes a much longer time to lose flesh than to lose strength.

The creamy layer which formed on the surface of the blood in this case consisted obviously of free fat, for it was wholly taken up by ether. Such a pellicle on the surface of the *serum* is not uncommon, nor, indeed, wholly abnormal; but it is rare to meet with it, as in this instance, overlying uncoagulated blood. The only similar case, so far as I know, is that recorded by Leubuscher, (in Virchow's Arch., bd. 18, hft. 1, s. 124,) in which it is stated that "a portion of the white serum which stood in a test-glass, *above the red portion of the blood*, was shaken with ether, and almost entirely dissolved.

In both these cases the peculiarity must have been due to the absence of coagulable fibrin. There is on record another case of fatty blood (Lecanu's) in which the fibrin is stated to have been entirely wanting; but no account is given of the appearance of the blood. In this and in some few other points, this case is exceptional. Otherwise, it belongs to the extensive class of cases of "milky serum," under which head it may be more conveniently considered.

I.—The *physical causes* of milky serum are two—free fat, and molecular albumen.

In cases of leucæmia, also, the serum may be lactescent from an excess of colourless blood-corpuscles. But as this appearance is presented only by the *defibrinated* serum, leucæmic blood may be excluded from this inquiry.*

A. Free fats. These belong (probably always) to the *saponifiable* group. In one case, indeed† (Lecanu's), *cholesterine* is stated to have been present in the enormous proportion of 108 in 1000 parts. But as the saponifiable fats were also in excess (9 in 1000), the lactescence of the serum may have been due to these.

The saponifiable fats of the blood (very variable in amount, but which may be roughly estimated at 1 in 1000)‡ exist in the form of an emulsion with the free alkali of that fluid. Should they, however, be in excess of the emulsive power of the alkali, or should the alkali be (as in certain cases of disease) deficient, the fat must necessarily appear in a free state, and, on standing, rise like any other cream to the surface.

The form in which it nearly always appears is that of *oil-globules*, as was first noticed by Hewson.§ In the present case it was perfectly homogeneous; and some similar instances have been observed by Professor Virchow.‖ These are, however, exceptions to the rule.

B. *Molecular albumen.* — That lactescence of serum is sometimes due to another cause than free fat was first observed by John Hunter;¶ but the fact was ignored or misapprehended until the more recent researches** of Simon and Scherer, Buchanan, and R. D. Thomson, placed it beyond question. These chemists found that turbidity of serum was (in some cases) partly occasioned by the presence of a molecular substance, not soluble in ether, but presenting an albuminous reaction. To this substance Simon and Scherer gave, rather hastily, the title of molecular *fibrin.* It is now generally spoken of as molecular albumen.

This substance forms no cream on the surface of the serum, but remains suspended in the fluid, thus rendering it *permanently* opaque, and so readily distinguishable from serum turbid from the presence of free fat *alone.* But frequently the two conditions are combined; the molecular albumen being associated with fat, either in a free state, and so rising to the surface of the turbid serum, or *included* in the substance of the albuminous molecules, from which it may be set free by chemical reagents.

It is, indeed, very questionable whether lactescence of serum is ever due to molecular albumen *alone.* Some cases are, however, recorded by the late Dr. Bostock†† in which the milky serum is described as containing "no proper oily matter," *although a creamy layer rose to the surface.* It is possible that in these cases the albumen was floated by means of included fat. Another extremely obscure case, but perhaps referable to this category, is one which has been repeatedly, but unaccountably, cited as one of fatty blood. It is known as Caventon's case.‡‡ In this the blood was permanently opaque; no cream appears to have formed on its surface; it was of neutral reaction, and *coagulable by heat.* A precipitate was thrown down by tincture of galls, but none by Hg. Cl_2, and very little by acids or alcohol. Caustic alkalies produced no effect upon it. The interpretation of this case is certainly difficult; but it seems most probable that the lactescence was due to more than one cause, and that one of the causes was the presence of albumen in some peculiar chemical state.

With these exceptions, molecular albumen appears to be always accompanied by *fatty* disease of the blood.

(To be concluded.)

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* Virchow's Cellularpath., s. 165.
† Gaz. des Hôp., 1835, Avr., 20-24.
‡ Becquerel and Rodier,—Recherches, &c., p. 23.
§ Exp. Enq., p. 149; or Gulliver's ed., p. 82, seq.
‖ Virchow's Gesammelte Abhundlungen, s. 138.
¶ J. Hunter on Blood, &c., ed. 1794, pp. 37-39.
** Simon, Méd. Chimie, ii., 220. Beiträge zur Chimie, i., 287. Scherer, Chem. u. Mikroskop. Untersuch., ss. 81, 85. Buchanan, London Medical Gazette, 1845, p. 1027. R. D. Thomson, (cited from Canstatt's Jahresb., 1845, bd. i.)
†† Bright's Rep. of Med. Cases, vol. i. p. 83.
‡‡ Annales de Chimie, t. xxxii. p. 288. (Ser. II. 1826.)

ON ALLARTON'S OPERATION FOR STONE IN THE BLADDER.

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MR. ALLARTON'S operation for stone in the bladder having engaged the attention of operating surgeons, it behoves all those who have had an opportunity of performing it to record their experience of its results.

The main objections which have been hitherto urged against its performance have been in reference to the size of the stone and the enlargement of the prostate gland, the consequent difficulty of extraction, and the effect of forcible dilatation on the neck of the bladder. Having lately performed this operation three times, where these difficulties were prominent features in each case, I desire to record the results.

J. B——, a child aged eight years, was admitted into the Westminster Hospital under my care, April, 1860, suffering from stone in the bladder. The symptoms had existed for eight months prior to his admission, and consisted in difficulty and frequency of micturition, which required considerable straining to effect; occasional passage of bloody urine; and, but rarely, pain at the extremity of the penis. The boy having been placed under the influence of chloroform, a sound was passed to the neck of the bladder, where its further progress was arrested by some foreign body, which a slight amount of pressure sufficed to displace. The sound being thus fairly introduced, a stone was immediately detected, which, from the extent of surface traversed, appeared to be large.

I decided on performing Mr. Allarton's operation. On May 8th, while under chloroform, a staff as large as the urethra would admit was introduced, and the stone immediately detected. The child was now secured in the ordinary manner, and the forefinger of the left hand being passed into the rectum, the exact situation of the prostate was ascertained. A sharp-pointed and somewhat triangular knife was now thrust into the median line of the perinæum, with the back towards and about three lines in front of the anus, the finger in the rectum guiding the knife, and preventing its being wounded. An incision was now made directly upwards, and the groove of the staff cut into by opening the urethra immediately in front of the prostate; and the knife was now run backwards and forwards to a slight extent so that it might be fairly divided, the tegumentary opening being enlarged as much as appeared necessary in its withdrawal. The forefinger was now removed from the rectum, and passed into the wound, with the nail in the groove of the staff, which thus formed an accurate guide for the director, which, being made with a handle at right angles, was passed along the groove into the bladder. The assistant was now directed to pull the staff gently but firmly upwards towards the symphysis pubis, whilst I pulled the director gently downwards, and the forefinger of the left hand, being passed between these two instruments, was gently worked between them with a twisting motion, dilating the parts as it proceeded until the neck of the bladder was reached, when both staff and director were withdrawn, and the dilatation was continued still further by rotating and moving the finger from side to side. The forceps were now introduced upon the finger, which was withdrawn as they passed into the bladder, so that to the present time no urine had escaped. The stone having been detected, the blades of the forceps were separated, when the gush of urine carried it between them, and with gentle traction it was removed. As was anticipated, it proved of considerable size, measuring two inches long and one inch wide, and weighing 240 grains; it was of the triple phosphate variety. The hæmorrhage was of the most trifling description, and beyond the smarting attendant upon a wound he hardly suffered anything. *There was no involuntary escape of urine* after the operation, but it was passed at will, for the first week through the wound, but afterwards per urethram. Eight days from the operation he was walking about the ward, and in a fortnight was discharged cured.

The second case occurred in a spare, feeble man, aged sixty-five, who had suffered from stone for four years prior to his admission. The urethra admitted a full-sized sound, and the prostate was perfectly healthy. The bladder was, however, considerably contracted, not holding more than four ounces of urine; and the stone, which was readily detected, was large and dense. The same proceedings were adopted as have been already described; but the stone, proving even larger than was anticipated, eluded the blades of the forceps. A large pair were consequently had recourse to, and the stone removed. It was found to measure two inches and a quarter long by one inch and a half in breadth, and weighed 370 grains. It was of the oxalate of lime variety, coated with phosphates. The patient was comfortable during the evening, and passed his urine at will. He was, however, seized in the morning with a rigor, and died suddenly.

The post-mortem was made twenty-eight hours after death, and the bladder having been removed, the incision was found to be exactly in front of the prostate. The bladder was now cut into, and the mucous membrane corresponding to the neck was found to be congested and slightly torn, not, however, extending into the prostate gland, and much less than is met with in the lateral operation. The kidneys were in an advanced stage of cystic disease; the heart fatty; but the other organs were healthy.

The third case occurred in my private practice, in the person of a gentleman aged seventy-five, of spare habit, who had suffered from diseased prostate more or less for the last eight years, during which time he had occasional hæmorrhage, sometimes slight, and sometimes sufficiently severe to call for the exhibition of gallic acid, the bleeding being at all times provoked by any extra walking or jolting exercise. Although there was no pain at the extremity of the penis after micturition, yet the symptoms to some extent simulated those of stone, and the bladder was from time to time carefully examined both by myself and others, without, however, detecting any foreign body. Early in 1859, while at his seat in the country, he was attacked with inflammation of the bladder, characterized by rigors, great frequency of micturition, spasms of a most violent character, and occasional pain at the extremity of the penis, the urine depositing the usual amount of muco-purulent, tenacious deposit. Suitable remedies were had recourse to, and in the course of three months he recovered; the spasms entirely subsided, the urine regained its healthy character, but the difficulty of expulsion had so far increased as to prevent his passing more than an ounce at a time. He was therefore directed to pass his own catheter three or four times in the day and night, which he accomplished without either difficulty or suffering. In the winter of 1859, being again in the country, he had another but more severe attack, which apparently arose from standing on damp ground, and it was evident, from a sudden discharge of pus and extreme tenderness of the prostate, that an abscess of that gland had formed and burst. His symptoms were now very distressing, the bladder much more irritable, and the pain at the extremity of the penis more decided; and being now unable to pass any urine naturally, he was compelled to rely entirely upon the catheter, which was passed every three hours. The bowels were daily relieved by enemata. The horizontal position was maintained, and all the known remedies had recourse to, belladonna, copaiba, and chlorodyne giving the greatest relief.

In the spring of the present year he was removed to town, the frequent and almost irresistible urgencies continuing, and the pain at the extremity of the penis being more acute. Opium, in the form of suppositories, was the only drug that now afforded the slightest relief.

On Sunday, June 15th, after violently straining at stool, the bladder became more than usually irritable; and being requested to pass his gum catheter, I immediately detected a calculus, rough, and so far as could be ascertained by such an instrument, not very large. A consultation with Mr. Arnott and Mr. Cæsar Hawkins was held; and as lithotrity offered no chances of relief, Allarton's operation was decided upon.

On June 27th he was placed under the influence of chloroform, and the operation, as already detailed, was performed. Not the slightest difficulty was experienced in reaching the neck of the bladder, but the size of the prostate prevented the interior being explored, or the stone being felt with the finger. The forceps were consequently substituted, and being buried to a considerable depth, a stone was caught and removed, proving large, smooth, and polished. Another was sought for and removed, which bore an accurate resemblance to the first. It was, therefore, evident there must be a third, which, after slight difficulty, was also included between the blades of the forceps, but being larger than either of the former ones, it required some little patience and gentle traction to remove it. The parts, however, yielded, and the third, somewhat roughened, stone was now abstracted. The first measured 1⅞ in. by 1¼ in.; the second, 1⅞ in. by 1⅞ in.; and the third, 1¼ in. by 1¼ in.; the weight of the three being 960 grains. The incision was insignificantly small; the hæmorrhage very trifling; and

my patient being now placed in bed, shortly recovered from the effects of the chloroform, and simply complained of the slight smarting of the wound. The neck of the bladder retained its contractility, and there was not any involuntary escape. The suppository was introduced as usual; and, excepting when the urine was withdrawn, he slept tranquilly. For the first three days he progressed in the most favourable manner; the intervals were increased, the catheter being introduced every four, instead of every three, hours; the spasms were less frequent and less intense, and he was nearly relieved from the pain he had previously experienced, when, on the fourth day, he was seized with rigors, extreme and urgent pain in the region of the stomach, vomiting, and his pulse, which was exceedingly weak, rose to 130; skin hot; countenance anxious; and the urine presenting an appearance of bloody jelly. Opium and stimulants were administered, the bladder was injected with tepid water, and he rallied. He, however, continued exceedingly ill for three or four days, when the attack gradually subsided, the urine became more natural, but the spasms of the bladder recurred; and fearing the possibility of a calculus having descended from the kidney, he was again examined, under the influence of chloroform, without however discovering any foreign body; a roughness was detected with the gum-elastic catheter, but not with the sound, and in all probability depended upon a calcareous coating of some portion of the mucous membrane; indeed, this was subsequently ascertained to be the case, for, upon introducing a lithotrity spoon, a portion of gritty matter was removed, and eventually the corresponding mucous surface, coated with phosphates, came away in the eye of the catheter. Small particles of the same deposit have from time to time escaped. The frequency and spasms have now entirely subsided; he is enabled to pass per urethram from two to three ounces of urine; the bladder will retain from ten to twelve ounces; the wound has so far healed as to be hardly perceptible, and when necessary he can introduce his own catheter. The bowels, which have hitherto required enemata of water, have acted naturally since taking the confection of senna; and an examination per anum proves the prostate to be diminished in size. He is daily gaining flesh and strength, and when the weather will permit drives out.

The present cases have been described simply as examples to prove that large calculi and an enlarged prostate form no bar to the operation, and, as far as they go, establish the facility with which a large stone can be removed without injury to the neck of the bladder. It is true that the mortality is about the average; but as in the fatal case there was probably sufficient cause in the state of the kidneys and heart superadded to the rigor, from which persons in advanced years frequently die, I cannot consider it as in any manner militating against the operation.

The case of the boy was interesting in showing how circumstances may alter and modify symptoms generally relied upon as characteristic of stone. The pain at the extremity of the penis was the exception and not the rule, and evidently depended upon the stone generally occupying the same position and requiring to be displaced before the sound could be fairly introduced. The diagnosis was correct in reference to its size, which it must be admitted very far exceeded the average of such cases at such an age.

In the second case, the facility with which the stone was detected, and the ringing sound, afforded sufficient evidence of its size and density to preclude any advantage from lithotrity.

The third case must be considered as the most important of the three. The size of the prostate—which did not permit the finger to reach the bladder after the necessary incisions had been made, the long duration of the disease, the inability to pass any urine without the introduction of a catheter, the irritable state of the bladder, the emaciated condition of my patient, and the presence of three such very large calculi, were sufficient to test the operation to the utmost. I may mention that this gentleman had been subject to severe bilious attacks which very much resembled the one that supervened on the fourth day, and that the issue of the case proves the symptoms to have depended upon a deranged liver.

I have described the operation as it was performed; and although the precaution of introducing the finger between the director and the sound may not be absolutely necessary, yet I am convinced it simplifies the operation to such a degree that no surgeon of common intelligence need fear undertaking it. The extraction of the stone requires care and gentleness. A minute lost is a minute gained, if a large calculus can be removed through the neck of the bladder without injury; and I feel convinced this can always be effected if the necessary care is exercised. In almost all the descriptions of the ordinary forms of operating, the direction is, to have a large external wound. Such is not necessary; and if a stone can be removed, without bruising, through a moderate wound, it is certainly better than making a large one.

From all that I have yet seen of Mr. Allarton's operation, I consider it a most valuable one: the wound is less; the hæmorrhage is less; the constitutional disturbance is less; there is no chance of infiltration of urine; and, as a matter of comfort to the patient, the ability to retain the urine is of the utmost value and importance.

Parliament-street, August, 1860.

REPORT OF

TWO CASES OF CONICAL CORNEA SUCCESSFULLY TREATED BY OPERATION.

By GEORGE LAWSON, Esq., F.R.C.S.,

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In a paper published by Mr. Bowman in the "Ophthalmic Hospital Reports" for Oct., 1859, he describes a mode of treatment he had been induced to pursue in cases of conical cornea. It consisted in altering the shape of the pupil, by converting the natural circular aperture which is placed immediately behind the apex of the cone of the cornea into a slit, which may be made either vertical or horizontal as the surgeon may desire. The operation is performed by drawing the iris with a Tyrrell's hook through a small incision made at the extreme margin of the cornea by a broad needle, and then fixing it there by Mr. Critchett's method of tying it with a piece of very fine thread. If a vertical pupil is desired, a portion of the iris is first drawn directly downwards, and there fastened, and at the expiration of eight or ten days, or when the eye has become perfectly quiet, a similar proceeding is adopted in the upward direction, and a slit-like pupil results. It becomes, as he there suggested, a matter of experience to determine what alteration in the shape of the pupil is most conducive to improve vision in this class of cases.

As few patients suffering from conical cornea have yet been submitted to this plan of treatment, a record of those who have been operated on, with the result which has accrued from the operation, becomes not only interesting, but extremely useful in deciding what amount of good we may hope to derive from surgical interference.

The two following cases I operated on, one in December and the other in January last; and as eight months have now expired, I may justly speak of the benefit which each has derived as permanent. First, it will be observed in reading the cases that in each the conicity has been much diminished—the apex of the cone has become rounded off into the general curvature of the cornea, and the central opacity is scarcely visible.

It is very probable that this arrest of the increasing conicity of the cornea is dependent upon an alteration of the direction of the pressure within the globe, which is greatest in the normal condition of the eye in the antero-posterior diameter, in a line drawn from behind and passing forwards through the centre of the pupil to the cornea,—to that point, in fact, which forms the apex of the cone of the cornea in eyes which are affected with this disease. Mr. Hulke has demonstrated by microscopical examination that this peculiar condition of cornea is dependent on disease localized in the central portion, and which, yielding to the pressure from within, bulges, and becomes extremely attenuated. If, therefore, by any means, we can alter the direction of this pressure so as to cause it to bear on a healthy portion of the cornea, we certainly place the eye in a more favourable condition; and it appears to me that the slit-like pupil, particularly if made a little to the inner or nasal side, not only allows a more healthy portion of the cornea to receive the pressure from within, but, from its increased size, distributes it over a larger surface, and thus deprives it of a portion of its force.

The next question is concerning the improvement of sight to be gained. In each of the two cases which I am about to quote, distant vision was manifestly improved. In the first case near vision also was benefited, but in the second case the improvement for near objects was not so great as that for distant ones. The improvement of vision, I believe, depends on the rays of

light being enabled, owing to the alteration in the shape of the pupil, to enter the eye through a portion of the cornea not much affected by the conicity, and not to the fact of the pupil being a long and narrow one; as when this slit-like pupil becomes dilated and oval, so as to be much larger than the original circular pupil, the patient still continues to experience benefit from the operation.

In each patient I performed a similar operation: instead of drawing the pupil directly upwards and then downwards, I drew it first downwards and slightly inwards, and afterwards upwards and slightly inwards, so that the vertical pupil is rather to the nasal side of the cornea.

CASE 1.—R. E——, aged thirty-one, a tall, thin, and rather delicate man, of temperate habits. Has never had any serious illness, but for the last sixteen months has complained greatly of debility, lassitude, and a disinclination to do any work. He suffers as often as two or three times in the week from nocturnal emissions, and feels very low and nervous. A few weeks ago, he accidentally discovered that with the left eye he was unable to distinguish objects, or to read the largest type. On looking at the eye, the cornea is seen to be very conical, with a distinct small central softening. The apex is opaque. He can distinguish a hand held in front of him, but he is unable with the affected eye to count the fingers. He cannot distinguish the markings or the hands on a watch.

On the 30th of November I drew the pupil downwards and inwards, fastening it in this position by Mr. Critchett's method of tying it with a fine ligature of silk.

Dec. 3rd.—I performed a similar operation upwards and inwards.

His sight was greatly improved by this procedure. He was enabled to count fingers and to distinguish the features of friends. I saw him about three months ago; he could then count my fingers at a distance of ten or twelve feet, and with difficulty he could make out the time on my watch. The conicity has certainly materially diminished. The right eye was, however, becoming slightly affected, requiring him to use concave glasses.

CASE 2.—W. M——, aged forty-two, a butler; a healthy but delicate-looking man, with a very anæmic appearance; married, and has two children. Twelve years ago he says that he could see well and read any ordinary type. He has now conical corneæ of both eyes; but in neither very severe. The conicity of the left is the greatest. With the left eye he cannot count fingers; but with a powerful concave glass he can do so with difficulty. The apex of the cone in this eye is slightly opaque. His object in seeking relief was that in following his employment he could not tell when he had filled the wine-glasses, and was frequently apt to pour the wine over on to the cloth. I performed an operation on this patient, in January last, exactly similar to that in Case 1. Shortly after he had gone back to his situation, he wrote to me, saying that he had derived very decided benefit from the operation. A week ago this patient called on me; and I then questioned him concerning the state of his vision. He said he thought he saw near objects better, but there was a great improvement in the way he saw those more distant. He was now able to pour out wine without spilling it; and in my presence, with his best eye (the right one) covered, he filled a wineglass with water to the very brim without spilling a drop. He could distinguish the markings and hands on my watch. The conicity of the cornea was clearly much diminished, and the opacity had almost disappeared.

Park-street, Grosvenor-square, Aug. 1860.

ON

FATAL EFFECTS ARISING FROM ENLARGEMENT OF THE THYMUS GLAND IN CHILDREN.

BY GEO. S. BRENT, L.S.A., London.

THERE has been brought under my notice, on several occasions, a fatal result from enlargement, or else non-absorption, of the thymus gland in young children. One of such instances occurred at Notting-dale, Kensington, in June last.

A child, two years and a half old, belonging to the labouring class, but well nourished, and altogether what might be termed a fine boy, died somewhat suddenly and quite unexpectedly on the 13th of June, at half-past six o'clock in the morning. The particulars of the illness and death of the child were but very imperfectly elicited. It was only ascertained that two days prior to the decease he was quite well; that on the day previously he suffered from sickness, of which not much notice was taken; and that on the next morning about three o'clock, still complaining of sickness, and in bed, he crawled away from the side of his mother, who about five o'clock sent for medical assistance. Whilst the messenger was gone, the child, as stated, had two convulsive fits, and then "went off." He had not previously appeared to suffer from any difficulty of breathing.

Mr. Hemming, of Norland-place, Notting-hill, the surgeon who had been called, followed the messenger to the house, and found the child dead, without any external indication of the cause of death. On his making a post-mortem examination, every organ in the body was found to present a natural and healthy appearance, except that the thymus gland was preternaturally large and vascular; it weighed an ounce and a quarter. The effect of this condition would probably be pressure on the adjacent nerves to such an extent as to irritate them, and occasion a spasm of the glottis, to which event the death in this instance was attributed.

On a former occasion, Mr. Hemming was called to a similar case, in which an enlarged thymus gland pressed upon the right recurrent nerve of the par vagum, and so appeared to have set up an irritation, which resulted in spasm of the glottis and consequent death. In this case the child was erroneously supposed to have swallowed some hot water; such, however, was not proved to have been the cause of the decease. Dr. Hayne, of Camden-town, also, was the medical attendant called in a similar instance. He found in a child about twenty months old, who had died suddenly, a thymus gland weighing ten drachms, which specimen, given to me by him, I for a long time possessed, preserved in spirit. I have in several other instances recognised sudden deaths in children, apparently from a spasmodic closure of the glottis, to be coincident with a considerable enlargement of the thymus gland.

The thymus in the human subject increases in size very rapidly after the seventh month of fœtal life, and at birth at the full period has commonly varied (as stated in the "Cyclopædia of Anatomy and Physiology") from 84 to 240 grains in weight. At nine months afterwards, according to the same authority, it is found to be about 270 grains—4½ drachms—in weight; at a variable time after which period it progressively declines in size. I find that Kopp states his having noticed several cases of suddenly fatal dyspnœa occurring in children in whom the gland was found of large size, and that he concludes there is some essential connexion between the glandular enlargement and the suffocative paroxysms. Dr. Copland ("Dictionary of Practical Medicine," art. Larynx and Trachea, p. 679) has remarked, however, that Mr. Hood, of Kilmarnock, was the first to direct attention to enlargement of the thymus gland and its influence in producing morbid closure of the glottis, with suffocation. But he does not even hint that the effects of the preternatural enlargement are other than mechanical—such as pressure on the veins at the top of the chest, inducing congestion and effusion in the head; and no supposition appears to be entertained by him that an unusual size of the gland is accompanied by an increased nervous susceptibility. I have been led to conclude, from the history of the cases that have come under my notice, that a correlation exists between the size of the thymus gland and the development of the brain and impressibility of the nervous system. In such instances of sudden death coincident with abnormal enlargement of the thymus as have fallen under my observation, the children have been noticed as peculiarly forward and intelligent for their ages. The work first quoted above states that "absence of the gland has only been observed in cases of acephalism, where the brain and many other parts have been simultaneously deficient." If it be true, then, that the greater size of the thymus gland has anything to do with the greater development of the nervous matter, force, or excitability, there will be a double reason why an unusual enlargement, or a non-absorption, of that body should occasion suffocative dyspnœa,—namely, both from the greater excitability produced, and the inordinate pressure exercised by the gland in a state of turgidity.

Keppel-street, Russell-square, August, 1860.

ROYAL COLLEGE OF SURGEONS.—It may save some of our readers a little inconvenience by reminding them that the Library and Museum of the College closed on Friday, the 31st ult., for the necessary cleansing of the rooms, and re-arrangement of the books and preparations. They will both be re-opened on Monday, the 1st proximo.